

# POLYMERIC MATERIALS AND COMPOSITES USAGE LIST

SPACECRAFT \_\_\_\_\_ SYSTEM/EXPERIMENT \_\_\_\_\_ GSFC T/O \_\_\_\_\_

DEVELOPER/CONTRACTOR \_\_\_\_\_ ADDRESS \_\_\_\_\_

PREPARED BY \_\_\_\_\_ PHONE \_\_\_\_\_ DATE PREPARED \_\_\_\_\_

GSFC MATERIALS EVALUATOR \_\_\_\_\_ PHONE \_\_\_\_\_ DATE RECEIVED \_\_\_\_\_ DATE EVALUATED \_\_\_\_\_

Area, cm <sup>2</sup>	Vol., cc	Wt., gm
1 0-1	A 0-1	a 0-1
2 2-100	B 2-50	b 2-50
3 101-1000	C 51-500	c 51-500
4 >1000	D >500	d >500

ITEM NO.	MATERIAL IDENTIFICATION <sup>(2)</sup>	MIX FORMULA <sup>(3)</sup>	CURE <sup>(4)</sup>	AMOUNT CODE	EXPECTED ENVIRONMENT <sup>(5)</sup>	REASON FOR SELECTION <sup>(6)</sup>	OUTGASSING VALUES	
							TML	CVCM
	<p><b>NOTES</b></p> <ol style="list-style-type: none"> <li>List all polymeric materials and composites applications utilized in the system except lubricants, which should be listed on polymeric and composite materials usage list.</li> <li>Give the name of the material, identifying number and manufacturer. Example: Epoxy, Epon 828, E. V. Roberts and Associates</li> <li>Provide proportions and name of resin, hardener (catalyst), filler, etc. Example: 828/V140/Silflake 135 as 5/5/38 by weight</li> <li>Provide cure cycle details. Example: 8 hrs. at room temperature + 2 hrs. at 150C</li> <li>Provide the details of the environment that the material will experience as a finished S/C component, both in ground test and in space. List all materials with the same environment in a group. Example: T/V : -20C/+60C, 2 weeks, 10E-5 torr, ultraviolet radiation (UV) Storage: up to 1 year at room temperature Space: -10C/+20C, 2 years, 150 mile altitude, UV, electron, proton, atomic oxygen</li> <li>Provide any special reason why the materials were selected. If for a particular property, please give the property. Example: Cost, availability, room temperature curing or low thermal expansion.</li> </ol>							

# INORGANIC MATERIALS AND COMPOSITES USAGE LIST

SPACECRAFT \_\_\_\_\_ SYSTEM/EXPERIMENT \_\_\_\_\_ GSFC T/O \_\_\_\_\_  
 DEVELOPER/CONTRACTOR \_\_\_\_\_ ADDRESS \_\_\_\_\_  
 PREPARED BY \_\_\_\_\_ PHONE \_\_\_\_\_ DATE PREPARED \_\_\_\_\_  
 GSFC MATERIALS EVALUATOR \_\_\_\_\_ PHONE \_\_\_\_\_ DATE RECEIVED \_\_\_\_\_ DATE EVALUATED \_\_\_\_\_

ITEM NO.	MATERIAL IDENTIFICATION <sup>(2)</sup>	CONDITION <sup>(3)</sup>	APPLICATION <sup>(4)</sup> OR OTHER SPEC. NO.	EXPECTED ENVIRONMENT <sup>(5)</sup>	S.C.C. TABLE NO.	MUA NO.	NDE METHOD
	<p>NOTES:</p> <ol style="list-style-type: none"> <li>List all inorganic materials (metals, ceramics, glasses, liquids and metal/ceramic composites) except bearing and lubrication materials, which should be listed on Form 18-59C.</li> <li>Give materials name, identifying number manufacturer.            Example: a. Aluminum 6061-T6                          b. Electroless nickel plate, Enplate Ni 410, Enthone, Inc                          c. Fused silica, Corning 7940, Corning Glass Works</li> <li>Give details of the finished condition of the material, heat-treat designation (hardness or strength), surface finish and coating, cold worked state, welding, brazing, etc.            Example: a. Heat-treated to Rockwell C 60 hardness, gold electroplated, brazed.                          b. Surface coated with vapor deposited aluminum and magnesium fluoride                          c. Cold worked to full hane condition, TIG welded and electroless nickel-plated.</li> <li>Give details of where on the spacecraft the material will be used (component) and its function.            Example: Electronics box structure in attitude control system, not hermetically sealed.</li> <li>Give the details of the environment that the material will experience as a finished S/C component, both in ground test and in space. Exclude vibration environment. List all materials with the same environment in a group.            Example: T/V: -20C/+60C, 2 weeks, 10E-5 torr, Ultraviolet radiation (UV)                          Storage: up to 1 year at room temperature                          Space: -10C/+20C, 2 years, 150 miles altitude, UV, electron, proton, Atomic Oxygen</li> </ol>						

LUBRICATION USAGE LIST			
SPACECRAFT _____	SYSTEM/EXPERIMENT _____	GSFC T/O _____	
DEVELOPED/CONTRACTOR _____	ADDRESS _____		
PREPARED BY _____	PHONE _____	DATE PREPARED _____	
GSFC MATERIALS EVALUATOR _____	PHONE _____	DATE RECEIVED _____	DATE EVALUATED _____

ITEM NO.	COMPONENT TYPE, SIZE MATERIAL <sup>(1)</sup>	COMPONENT MANUFACTURER & MFR. IDENTIFICATION	PROPOSED LUBRICATION SYSTEM & AMT. OF LUBRICANT	TYPE & NO. OF WEAR CYCLES <sup>(2)</sup>	SPEED, TEMP., ATM. OF OPERATION <sup>(3)</sup>	TYPE OF LOADS & AMT.	OTHER DETAILS <sup>(5)</sup>
<p><b>NOTES</b></p> <p>(1) BB = ball bearing, SB = sleeve bearing, G = gear, SS = sliding surfaces, SEC = sliding electrical contacts. Give generic identification of materials used for the component, e.g., 440C steel, PTFE.</p> <p>(2) CUR = continuous unidirectional rotation, CO = continuous oscillation, IR = intermittent rotation, IO = intermittent oscillation, SO = small oscillation, (&lt;30°), LO = large oscillation (&gt;30°), CS = continuous sliding, IS = intermittent sliding. No. of wear cycles: A(1-10<sup>2</sup>), B(10<sup>2</sup>-10<sup>4</sup>), C(10<sup>4</sup>-10<sup>6</sup>), D(&gt;10<sup>6</sup>)</p> <p>(3) Speed: RPM = revs./min., OPM = oscillations/min., VS = variable speed CPM = cm/min. (sliding applications) Temp. of operation, max. &amp; min., °C Atmosphere: vacuum, air, gas, sealed or unsealed &amp; pressure</p> <p>(4) Type of loads: A = axial, R = radial, T = tangential (gear load). Give amount of load.</p> <p>(5) If BB, give type and material of ball cage and number of shields and specified ball groove and ball finishes. If G, give surface treatment and hardness. If SB, give dia. of bore and width. If torque available is limited, give approx. value.</p>							

# MATERIALS PROCESS UTILIZATION LIST

SPACECRAFT \_\_\_\_\_ SYSTEM/EXPERIMENT \_\_\_\_\_ GSFC T/O \_\_\_\_\_

DEVELOPER/CONTRACTOR \_\_\_\_\_ ADDRESS \_\_\_\_\_

PREPARED BY \_\_\_\_\_ PHONE \_\_\_\_\_ DATE PREPARED \_\_\_\_\_

GSFC MATERIALS EVALUATOR \_\_\_\_\_ PHONE \_\_\_\_\_ DATE RECEIVED \_\_\_\_\_ DATE EVALUATED \_\_\_\_\_

ITEM NO.	PROCESS TYPE <sup>(1)</sup>	CONTRACTOR SPEC. NO. <sup>(2)</sup>	MIL., ASTM., FED. OR OTHER SPEC. NO.	DESCRIPTION OF MAT'L PROCESSED <sup>(3)</sup>	SPACECRAFT/EXP. APPLICATION <sup>(4)</sup>
<p><b>NOTES</b></p> <p>(1) Give generic name of process, e.g., anodizing (sulfuric acid).</p> <p>(2) If process is proprietary, please state so.</p> <p>(3) Identify the type and condition of the material subjected to the process. E.g., 6061-T6</p> <p>(4) Identify the component or structure of which the materials are being processed. E.g., Antenna dish</p>					